made either with Fleisch's [3] apparatus or Hochrein's.[4] A description and a discussion of both these instruments have been presented in previous reports. None of the measurements made by these investigators were obtained during work, since their equipment was not flexible enough to permit such measurements.

Altitude Measurements.—Fleisch [5] used his apparatus to make measurements on a few subjects at various altitudes but presented few data. Hall and Wilson [6] published data on maximum and mean air flow measurements during inspiration at various altitudes. Pappenheimer and Lilly [7] described an instrument for measuring inspiratory and expiratory air flow at altitude but showed only a few typical curves. A brief description of their apparatus was given in a recent report. Other service investigators [8] have developed apparatus for inspiratory air flow measurements at altitude, but no data concerning their subjects are presented.

Previous Work in This Laboratory.—Our first investigation [9] led to publication of inspiratory data on several sedentary and working subjects at various work rates without and with resistance to breathing. Inspiratory and expiratory measurements at 830 kilogram-meters (Kg.-M.) (6,000 foot-pounds [f.-p.]) per minute and 1,107 Kg.-M. (8,000 f.-p.) per minute with minimal inspiratory and expiratory resistance and with resistance conditions equivalent to those of service gas masks were obtained in this laboratory by Silverman and co-workers.[10] Measurements at 830 Kg.-M. and 415 Kg.-M. over a wide range of resistance conditions were presented in a report on allowable resistance to breathing.[11] The present article presents both

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